

BELTSVILLE |

BALTIMORE | STERLING |

ROCKVILLE

January 26, 2022

Mr. Mike Kelly **North Point Builders** 1050 North Point Road, Suite 101 Baltimore, MD 21224

Subject:

Baltimore City Community College - Loop Road Retaining Wall

Additional Geotechnical Engineering Investigation

Baltimore, Maryland KEI Project No. G22002

Dear Mr. Kelly:

Kim Engineering, Inc. (KEI) has completed eight (8) standard penetration tests (SPT) soil borings along the centerline of the proposed retaining wall at the subject site. This work was done in response to a change of field conditions encountered during the installation of the first soldier pile at the west end of the wall. Based on the subsurface investigation done in 2019 that included three (3) soil borings for the retaining wall design the disintegrated rock and sound rock was expected at depths of about 30 to 33 feet at that location. However, the first drilled shaft advanced to a depth of 60 feet without much resistance. It should be noted that the three soil borings done for the original geotechnical investigation in 2019 were performed in an offset location since the actual wall centerline was not accessible at that time.

The subsurface investigation along the actual wall alignment was done between January 14 and January 24, 2022. A CME D-55 track mounted geotechnical drill rig was mobilized to the site to advance SPT borings using hollow steam augers. Eight SPT borings were drilled to refusal defined as 50 blows per 1 inch. Rock cores were extracted in two locations RW-3 and RW-5. The boring locations are shown on the attached site plan.

The original KEI recommendation for the wall support design was embedding the soldier pile minimum 5 feet or twice the diameter of pile into the disintegrated rock layer. disintegrated rock is defined as native residual soil with SPT N-value above 60 blows per foot (bpf).

The subsurface investigation indicated deep soil profile at the west end of the wall location and shallower but variable depths to refusal on rock or boulders along most of the wall. The description of soil profiles is shown on attached boring logs. The 10-foot rock cores from RW-3 and RW-5 produced highly fractured and highly weathered shist rock. However, soil was



extracted in core barrels at both locations. This makes us to believe that shallower refusal depths are on boulders suspended in soil material. The intact and sound rock should not produce rock cores with soil. The pictures of rock cores are attached to this letter report.

We were not able to advance through rock cores and continue sampling below with hollow steam augers. We recommend additional testing using specialty casing that would allow penetrating through the first layer of hard material that could be boulders to verify conditions below.

The table below summarizes known depts to disintegrated rock layer for pile embedment.

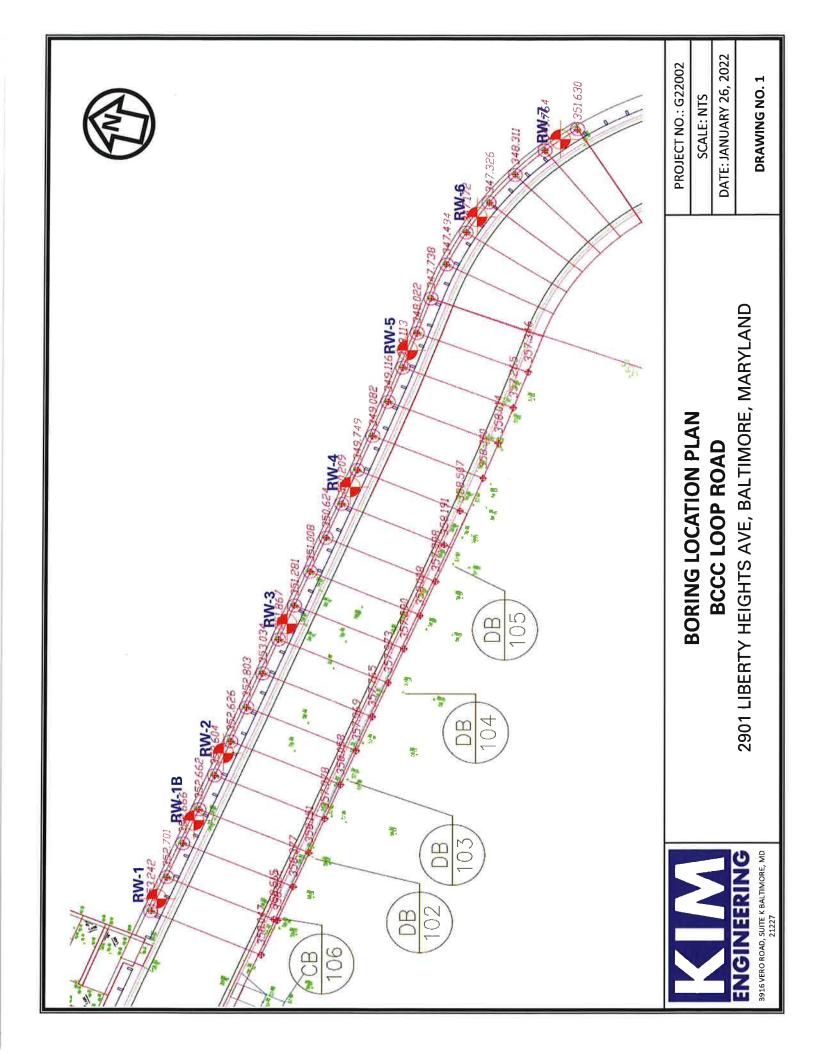
Boring ID	Depth to Disintegrated Rock for Pile Support (ft)	Depth to Rock (ft)	Depth to Boulder (?) Needs Verification (ft)
RW-1	53	61.5	None
RW-1B	28	59	None
RW-2	Unknown	Unknown	9.4
RW-3	Unknown	Unknown	24
RW-4	Unknown	Unknown	20.5
RW-5	Unknown	Unknown	13.5
RW-6	Unknown	Unknown	25.1
RW-7	33	37.1	None

We appreciate the opportunity to be of service to you for this project. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Very truly yours,
KIM ENGINEERIN

Tom Labuda, P.E. P. Principal Engineer

- Enclosure:
 - 1. Boring Location
 - 2. Boring Logs
 - 3. Rock Core Pictures



BORING NUMBER RW-1 PAGE 1 OF 2

		orth Point	G22002		T NAME		Baltimore,					
										SIZE 6"		
			18/22 COMPLETED 1/18/22		O WATER		353 ft		·IULE	VIEE 0		
		METHOD	TOR Kim Engineering Inc.									
			CHECKED BY _TL									
IOIE	S Ca	ved @ 31	.25	Ar	TEK DKI	LLING		_				
		_			H.	%	BLOW COUNTS (N VALUE)	z	(pcf)	▲ SPT	N VALU	E 📥
Ε	GRAPHIC LOG	ELEVATION	MATERIAL REGORDATION		SAMPLE TYPE NUMBER	RECOVERY (RQD)	55	POCKET PEN. (tsf)	<u></u> = €	PL 	MC	LL —
## E (#)	돌의	\{	MATERIAL DESCRIPTION		₽N	혓附	> ≥ ≤ > = = = = = = = = = = = = = = = = = = =		55			
	ြိ				SAN	H) S O	l Q	DRY	☐ FINES C		
-	ПТ		White, light brown, dark brown, greenish brown	n dark						20 4	0 60	80
3			gray, light gray, moist, stiff to hard, sandy SILT	(ML) with								
<u> </u>			rock fragments.									į
8												
72												9
5											3	
35												i
2=												
-												:
3					SS	78	4-5-8			A .		
10					1		(13)	1			- 1	
100											ŧ	
-												
2												
3					SS 2	89	7-7-7			🛦		
15					/ / 2		(14)	1			333	
8												
94												-
-					SS 3	89	8-8-9 (17)			A		
20					1 3		(17)	1				
0										\		
-												
7.7												
oe Oe					SS 4	89	7-15-20 (35)			\ \		:
25							(00)	1				÷
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S.											/:	
2		204.50									1	i
30	W	324.50	DISINTEGRATED ROCK classified as grayish greenish brown, dark brown, light brown, light g	јгау,	SS 5	100	10-34-37 (71)					A :
30			moist, very dense, silty SAND (SM) with decorrock fragments.	nposed	7 3		(, 1)	1				÷
-			TOOK ITAYINGING.								/	:
	W										/	•
-		240 50			1							:
-		319.50			SS 6	100	5-10-10	1	1	· /		

KIM ENGINEERING, INC. Consulting Geotechinical Engineers

BORING NUMBER RW-1 PAGE 2 OF 2

			Builders G22002				C Loop Imp Baltimore,		nent			
DEPTH (ff)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	ည	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL FINES	MC CONTEN	LL —
40			Grayish brown, greenish brown, dark brown, light light gray, moist, medium dense to very dense, s SAND (SM) with decomposed rock fragments. (continued)	t brown, ilty	SS 7	100	5-13-19 (32)					A the first of the
50					SS 8	100	9-7-16 (23) 20-23-35 (58)					
0		299.50	DISINTEGRATED ROCK classified as grayish br greenish brown, dark brown, light brown, light gra moist, very dense, silty SAND (SM) with decomp rock fragments.	ry, osed	SS 10 SS 11 SS	100	50/5"					
	NAX.	291.40	Bottom of hole at 61,6 feet.		12	100	30/ I					

BORING NUMBER RW-1B PAGE 1 OF 2

	2		Builders				C Loop Imp		nent			
			G22002				Baltimore,					
			8/22 COMPLETED 1/19/22				352.66 ft		HOLE	SIZE _6"		
			TOR Kim Engineering Inc.		D WATER							
DRILL	ING ME	THOD	H.S.A	A1	TIME OF	DRIL	LING					
LOGG	ED BY	SE	CHECKED BY TL	A1	END OF	DRILL	.ING					
NOTES	S cave	ed @ 48		AF	TER DRI	LLING						
					Ш	%	ပ္ပ	Ļ	_2	▲ SPT	N VALU	E▲
_	ပ္	8			SAMPLE TYPE NUMBER	RECOVERY 9 (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL	MC	LL
DEPTH (ft)	GRAPHIC	ELEVATION	MATERIAL DESCRIPTION		MB FE		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	E E	돌열	Ī	•	Ŧ
8	용기	<u>A</u>			M S	ပ္သြင္င	≥2 02.	Š_	یا	☐ FINES C	ONTEN	T (%) □
		<u> </u>			\ &		BL(\(\)	5	20 40		80
	and		Greenish brown, dark gray, dark brown, moist	medium								
-			dense to dense, silty SAND (SM) with decomp fragments.	osed rock								1
+			iraginerits.								:	ŧ
. 4												
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5											- 1	- 1
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. 4												
					V ss		5-9-9	1				
10					1	100	(18)			1		-
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										1		
1		220.16				_						
15		339.16	Greenish brown, gray, dark brown, moist, stiff, SILT (ML).	sandy	SS 2	89	7-10-16 (26)			\		9
13								1				
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- 4	Ш				L						\	:
- 1		334.16	Gray, white, greenish brown, moist, very dens SAND (SM) with highly decomposed rock frag		SS 3	100	15-23-30 (53)				A	1
20			SAND (SW) Will Highly decomposed fock hag	IIICIII.	1 3		(53)	1		1 3	1	
- 4											\.	i
											\ <u>:</u>	į
- 4											\:	:
. 4					SS 4	89	13-20-40	1			E	1
25					4	09	(60)				1	
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.]												\ :
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7	1//	324.16	DISINTEGRATED ROCK classified as greenis	sh brown	1/ 99		22-33-46					\:
30			gray, dark brown, moist, very dense, silty SAN	D (SM)	SS 5	100	(79)				1	1
			with highly decomposed rock fragments.								i	
1												
- 4	X											1
1								4	10	min 27 (2)	* * * * * * * * * * * * * * * * * * * *	110 150
					X SS	-		-	1	1 1	į	i

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BORING NUMBER RW-1B PAGE 2 OF 2

		orth Point					C Loop Imp Baltimore,		iei II			
(f)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL 		LL I ENT (%)
40			DISINTEGRATED ROCK classified as greenish brown, gray, dark brown, moist, very dense, silty SAND (SM) with highly decomposed rock fragments. (continued)	X	SS 7	89	18-27-46 (73)			20	40 60	0 80
45		309.16	Greenish brown, gray, brown, moist, dense to very dense, silty SAND (SM) with highly decomposed rock fragments.	M	SS 8	100	15-20-30 (50)				*	
50				X	SS 9	100	17-22-33 (55)					\
55		299.16	DISINTEGRATED ROCK classified as greenish brown, gray, brown, moist, very dense, silty SAND (SM) with highly decomposed rock fragments.	×	SS 10	100	50/5"					
		293.96	Bottom of hole at 58.7 feet.		SS 11	(100)	50/3"					

BORING NUMBER RW-2 PAGE 1 OF 1

			Builders G22002				C Loop Imp Baltimore,		IOIIC				
			8/22 COMPLETED 1/18/22						HOLE	SIZE 6	,		_
			TOR Kim Engineering Inc.										
RILL	ING M	ETHOD	H.S.A	AT	TIME OF	- DRILI	LING						
ogg	ED BY	SE	CHECKED BY _TL				ING						
OTE:	s			AF	TER DRI	LLING							
					ш	%	ဟ	L.		A 5	PT N	VALUE	•
.	일	S S			I'R I'R	اچُ ﴿	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL	М		LL
€	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		SAMPLE TYF NUMBER	RECOVERY (RQD)	8	£ €	Z g	<u> </u>	_		Ŧ
د	8_	E E			ABS		ŠÉ	Ö	₹ .	☐ FINE	S CO	NTENT	(%)
		ш			Ŝ	<u>~</u>	뮵	4		20	40	60	80
			Gray, white, moist, very dense, silty SAND (SM) rock fragment.	with						2000	į		
			vosk nagmonk.								i	1	
_											į	1	
					√ ss	78	17-27-22			27.00.00			
5					<u>1</u>	/6	(49)					<u>\</u>	-
-											1		
-											į		\
-											į		
+		344.10	DISINTEGRATED ROCK classified as gray, white	e,	SS 2	91	24-50/5"				į		
		343.20	moist, very dense, silty SAND (SM) with highly decomposed rock fragments.	Γ		\bigcap		1			•		-
			Bottom of hole at 9.4 feet.								Ì		-
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BORING NUMBER RW-3 PAGE 1 OF 1

KIM ENGINEERING, INC.
Consulting Geotechinical Engineers
Baltimore, Maryland

CLIENT North Point Builders	PROJECT	NAME_	BCC	C Loop Imp	roven	nent				
PROJECT NUMBER G22002	PROJECT	LOCATION	ON_	Baltimore, l	MD					
DATE STARTED 1/19/22 COMPLETE	ED 1/19/22 GROUND	ELEVATI	ON	351 ft		HOLE	SIZE 6"			
DRILLING CONTRACTOR Kim Engineering Inc.	GROUND	WATER I	LEVE	LS:						
DRILLING METHOD H.S.A	AT	TIME OF	DRIL	LING						
LOGGED BY SE CHECKED	BY TL AT	END OF D	RILL	.ING						
NOTES	AF	TER DRIL	LING							
_ 0 2		A PE	% >	INTS E)	EN	WT.			/ALUE	
GRAPHIC LOG CRAPHIC LOG MATERIAL DES	SCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	UNIT WT. (pcf)	PL I—	M		<u> </u>
		SAM	REC	BLOv (N	POC	DRY	☐ FINE:	S CON 40	ITENT 60	(%) □ 80
Greenish brown, dark brown dense, silty SAND (SM) wi		SS 1	67	23-14-13 (27)			^	AND THE PROPERTY OF THE PROPER		
10 337.50 Greenish brown, dark brow	vn, gray, moist, stiff, sandy	SS 2	89	5-7-10 (17)		ī	4			
15 SILT (ML) with rock fragme	ent.	3	56	(22)			1		-	
335.00 Rock fragments.							\	\		
333.00 Greenish brown, dark brown SILT (ML) with rock fragme	vn, gray, moist, hard, sandy ent.	SS 4	33	22-20-19 (39)				<u>\</u>		
327.20 Gray, streaked and speckle grained, moderately fracture Schist.	ed white, fine to medium red, medium weathered,	RC 1	68 (0)	50/1"						>>/
322.20 Gray, streaked and speckle grained, moderately fractur weathered, Schist with abo (SM) with highly decompose bottom of rock core.	red, medium to fully out 13 inches of silty SAND	RC	(0) 65 (18)						***************************************	
317.20 Bottom of he	ole at 33.8 feet.									

BORING NUMBER RW-4 KIM ENGINEERING, INC. Consulting Geotechinical Engineers Baltimore, Maryland CLIENT North Point Builders PROJECT NAME BCCC Loop Improvement PROJECT NUMBER G22002 PROJECT LOCATION Baltimore, MD DATE STARTED _1/21/22 ____ COMPLETED _1/21/22 GROUND ELEVATION 350 ft HOLE SIZE 6" DRILLING CONTRACTOR Kim Engineering Inc. **GROUND WATER LEVELS:** DRILLING METHOD H.S.A AT TIME OF DRILLING _---LOGGED BY SE CHECKED BY TL AT END OF DRILLING _-_ AFTER DRILLING _-_ NOTES BLOW COUNTS (N VALUE) ▲ SPT N VALUE ▲ SAMPLE TYPE NUMBER POCKET PEN. (tsf) DRY UNIT WT. (pcf) RECOVERY 9 (RQD) GRAPHIC LOG ELEVATION DEPTH (ft) MC LL MATERIAL DESCRIPTION ☐ FINES CONTENT (%) ☐ 40 60 Gray, greenish brown, dark gray, moist, medium dense, silty SAND (SM) with rock fragments. 10-10-8 SS 33 (18)10 SS 5-6-10 67 2 (16)GEOTECH BH PLOTS BCCC LOOP ROAD IMPROVEMENT ADD GPI, GPJ, GINT US, GDT 1/26/22 >> 331.50 DISINTEGRATED ROCK classified as silty SAND (SM) SS 80 50/5" 3 with rock fragments. 50/1" SS 100 329.40 Bottom of hole at 20.6 feet. 4

BORING NUMBER RW-5 PAGE 1 OF 1

	-		Builders				C Loop Im		nent			
			G22002				Baltimore,					
			21/22			-	348 ft		HOLE	SIZE 6		
			CTOR Kim Engineering Inc.		D WATER		_					
			_H.S.A									
			CHECKED BY _TL									
NOTES				AF	TER DRI	LLING						
					М	%	TS	2	_==	▲ S	PT N VALU	JE 🔺
DEPTH (ft)	APHIC OG	ELEVATION	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL -	MC	LL -I
	GR L	ELEV			SAMP	RECO (R	SLOW (N V	POCK (DRY L	-	S CONTEN	
	ш		Greenish brown, white, brown, moist, stiff, sandy	CII T			ш	-		20	40 60	80
5			(ML).	GIL!						***************************************		
10					SS 1	100	3-4-9 (13)			•		
	072	334.50	Gray, streaked and speckled white, fine to mediu	m						The state of the s		
15			grained, slightly fractured, medium weathered, S	chist.	RC 1	100 (73)				nati nati nati nati nati nati nati nati		
20		329.50	DISINTEGRATED ROCK classified as greenish streaked and speckled white, silty SAND (SM) wi highly decomposed rock throughout the whole ro run (60 in.).	th	RC 2	20 (0)						
2		324.50	Bottom of hole at 23.5 feet.									

BORING NUMBER RW-6 PAGE 1 OF 1

	ECTN	IUMBER	G22002	PROJEC	T LOCAT	TION _	Baltimore,	MD					
ATE	STAR	TED _1/2	4/22 COMPLETED 1/24/22	GROUND	ELEVA"	TION	347 ft		HOLE	SIZE 6"			
RILL	ING C	ONTRAC	TOR Kim Engineering Inc.										
			H.S.A				LING						
			CHECKED BY TL				ING						
OTE	s			AF	TER DRI	LLING							
					뮙	%	STS (z.	5	▲ SI	PT N V	/ALUE	
(#) (#)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL I	Mo		LL H
7	GRA	FE	WATERIAL BESSAII TION		MPL	OS R	N N N N	S S	\ } D	☐ FINE	S CON	ITENT	۲ (%)
		Ш			/S	R.	B	M.	ä	20	40	60	80
			Dark gray, white, brown, moist, stiff, sandy SILT (ML).						1	į	1	
1/2													
											1		
\													
5											-	-	-
3.													
										1	1		
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0				8	X 1	100	(18)			4	1	<u> </u>	-
0										\	i		į
3-											1		1
:-													
		333.50	Greenish brown, dark brown, gray, moist, dense, SAND (SM) with rock fragments.	silty	SS 2	44	12-19-15 (34)				\	į	
5			o and (only man out magnitude	::	/ \ _		(04)				H	-	÷
. 1													
													-
		328.50	Dark gray, white, moist, stiff, sandy SILT (ML).		√ ss	100	8-10-14					1	•
20				:	$\sqrt{\frac{3}{3}}$	100	(24)			_			-
174												\	-
0.0											į		`.
-													
,		323.50	DISINTEGRATED ROCK classified as gray, brow moist, very dense, silty SAND (SM) with rock frag	n, ments	SS 4	100	50/3"						1
25	(///)	321.90	Bottom of hole at 25.1 feet.		SS	100	50/1"				1	1	÷
					5								
										1	į	:	
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										80 80 80 80 80 80 80 80 80 80 80 80 80 8			

KIM ENGINEERING, INC.

BORING NUMBER RW-7

ľ		IV	Consulting Geotechinical Engineers Baltimore, Maryland							PAGE 1 OF 2
CLIEI	NT_N	lorth Poin	t Builders I	PROJEC	T NAME	BCC	C Loop Imp	rovem	nent	
PRO.	JECT	NUMBER		PROJEC	T LOCAT	ION _	Baltimore,	MD		
DATE	STA	RTED 1/	/24/22 COMPLETED 1/24/22	GROUNE	ELEVA	TION _	350 ft		HOLE	SIZE 6"
DRILI	LING	CONTRAC	CTOR Kim Engineering	GROUNE	WATER	LEVE	LS:			
DRILI	LING	METHOD	H.S.A	AT	TIME OF	DRIL	LING			
LOGG	GED E	Y SE	CHECKED BY _TL	AT	END OF	DRILL	.ING			
NOTE	:s		E :	AF	TER DRII	LLING				
		7			H	%	TZ (z	Ž.	▲ SPT N VALUE ▲
DEPTH (ft)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		SAMPLE TYP NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DNIT WT. (pcf)	PL MC LL
DE	GR/	ELEV			AMPI	RCO (R	N (S (S	ock (DRY U	☐ FINES CONTENT (%) ☐
	12.12.12°			(01.1)	0)	<u> </u>	Δ	ь.		20 40 60 80
 5			Brown, gray, dark brown, black, moist, silty SAND ((SM).						
		345.00	DISINTEGRATED ROCK classified as brown, gray, brown, black, moist, dense to very dense, silty SAN (SM).	1D	SS 1	100	18-20-41 (61)			^
10		341.50	Brown, gray, dark brown, moist, dense, silty SAND (SM).	ì	SS 2	89	25-25-21 (46)		-	/
15		336.50 331.50	White, gray, dark brown, moist, stiff, clayey SILT (CL-ML) with decomposed rock fragments.		SS 3	100	5-6-24 (30)			
20		331.30	Light brown, gray, dark brown, white, moist, dense to very dense, silty SAND (SM) with weathered rock fragments.	to	SS 4	100	18-25-35 (60)			
25					SS 5	100	17-22-22 (44) 10-10-23 (33)	2		
-		316.50			× SS	100	50/4"			*

GEOTECH BH PLOTS BCCC LOOP ROAD IMPROVEMENT ADD GPI, GPJ GINT US GDT 1/28/22

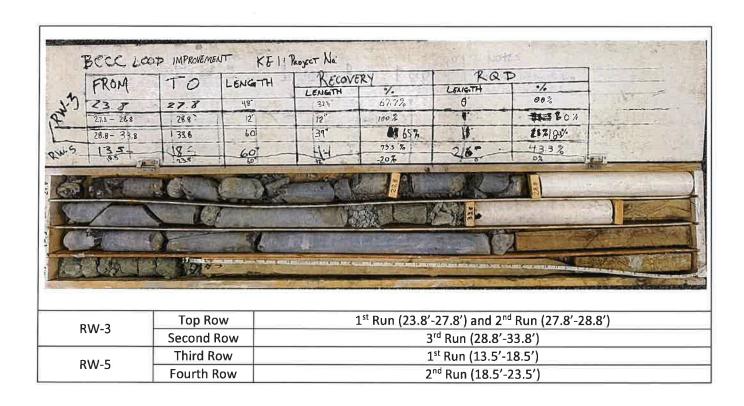
KIM ENGINEERING, INC.

BORING NUMBER RW-7 PAGE 2 OF 2

ROJECT N	orth Point		PROJECT NAME PROJECT LOCA				neni				
(ft) GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	က	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL FINE	S CON	ITENT	LL - I (%)
		DISINTEGRATED ROCK classified as light brodark brown, white, moist, dense to very dense, SAND (SM) with weathered rock fragments. (or	own, gray, silty ontinued)					20	40	60	80
	312.90	Bottom of hole at 37.1 feet.	SS 8	100	50/1"						



➤ Photo of Core Box





BELTSVILLE | BALTIMORE | STERLING | ROCKVILLE

January 26, 2022 Updated on March 10, 2022

Mr. Mike Kelly North Point Builders 1050 North Point Road, Suite 101 Baltimore, MD 21224

Subject:

Baltimore City Community College - Loop Road Retaining Wall

Additional Geotechnical Engineering Investigation

Baltimore, Maryland KEI Project No. G22002

Dear Mr. Kelly:

Kim Engineering, Inc. (KIM) has completed total eleven (11) standard penetration tests (SPT) soil borings including three (3) additional soil borings using specialty casing along the centerline of the proposed retaining wall at the subject site. This work was done in response to a change of field conditions encountered during the installation of the first soldier pile at the west end of the wall. Based on the subsurface investigation done in 2019 that included three (3) soil borings for the retaining wall design the disintegrated rock and sound rock was expected at depths of about 30 to 33 feet at that location. However, the first drilled shaft advanced to a depth of 60 feet without much resistance. It should be noted that the three soil borings done for the original geotechnical investigation in 2019 were performed in an offset location since the actual wall centerline was not accessible at that time.

The subsurface investigation along the actual wall alignment was done between January 14 and January 24, 2022, and the additional soil borings were performed between February 28 and March 2, 2022. A CME D-55 track mounted geotechnical drill rig was mobilized to the site to advance SPT borings using hollow steam augers and mud rotary methods. Initially, eight SPT borings were drilled to refusal defined as 50 blows per 1 inch and the rock cores were extracted in two locations RW-3 and RW-5. The soil borings RW-2, RW-3 and RW-5 were redrilled (named as RW-2A, RW-3A and RW-5A in boring logs) through the boulder using specialty casing. The boring locations are shown on the attached site plan.

The original KIM recommendation for the wall support design was embedding the soldier pile minimum 5 feet or twice the diameter of pile into the disintegrated rock layer. The disintegrated rock is defined as native residual soil with SPT N-value above 60 blows per foot (bpf).



The subsurface investigation indicated deep soil profile at the west end of the wall location and shallower but variable depths to refusal on rock or boulders along most of the wall. The description of soil profiles is shown on attached boring logs. The 10-foot rock cores initially extracted from RW-3 and RW-5 produced highly fractured and highly weathered shist rock. However, soil was extracted in core barrels at both locations. This makes us to believe that shallower refusal depths were on boulders suspended in soil material. The intact and sound rock should not produce rock cores with soil.

Further subsurface investigation was carried out at the soil borings RW-2, RW-3, and RW-5 locations with drilling through boulders to verify depths to continuous disintegrated rock and bedrock below. Soil borings advanced through boulders at these three locations indicated sound bedrock at depths of about 34.5 feet to 49 feet. The pictures of rock cores are attached to this letter report.

The table below summarizes known depts to disintegrated rock and bedrock below. For borings RW-4 and RW-6 corresponding depths were extrapolated from known depths in adjacent borings and should be used with caution. This information is for the structural engineer to review the wall design.

Boring ID	Depth to Disintegrated Rock (ft)	Depth to Rock (ft)	Depth to Boulder (ft)
RW-1	53	61.5	None
RW-1B	53	58	None
RW-2/RW-2A	34	39.5	9.4
RW-3/RW-3A	45	49	24
RW-4	Unknown (40 extrapolated)	Unknown (45 extrapolated)	20.5
RW-5/RW-5A	32	34.5	13.5
RW-6	Unknown (33 extrapolated)	Unknown (36 extrapolated)	25.1
RW-7	33	37.1	None

The soil boring logs attached herewith represents the depths and thickness of those layers encountered during drilling.



We appreciate the opportunity to be of service to you for this project. If you have any questions regarding this report, please do not hesitate to contact either of the undersigned.

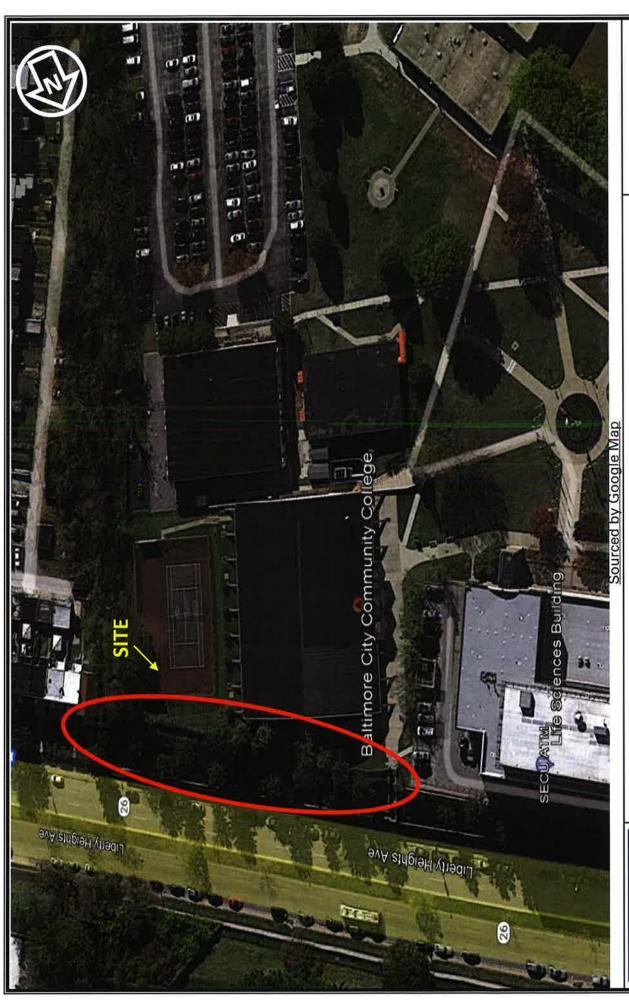
Very truly yours, KIM ENGINEERING, INC.

Tom Labuda, P.E. P.G. Principal Engineer

- Enclosure:
 - 1. Boring Location Plan
 - 2. Boring Logs
 - 3. Rock Core Pictures



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO.:PE 42702 EXPIRATION DATE: 10-12-2022.





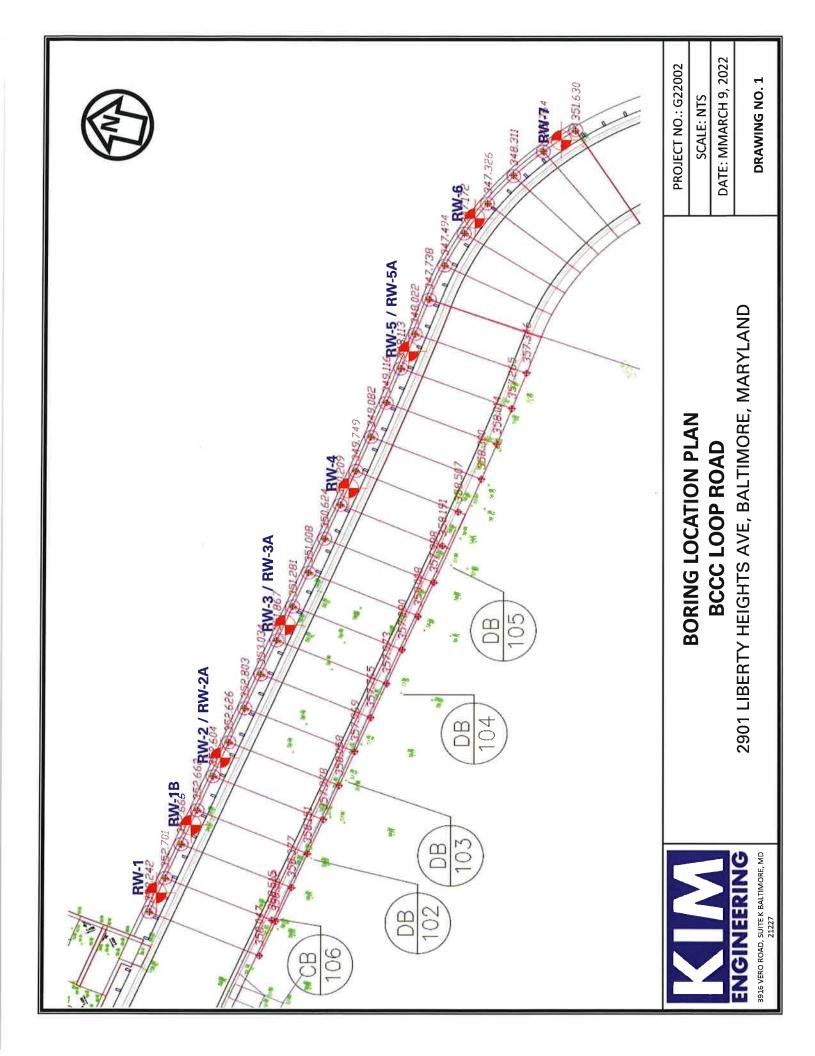
2901 LIBERTY HEIGHTS AVE, BALTIMORE, MARYLAND

PROJECT NO.: G22002

SCALE: NTS DATE: JANUARY 26, 2022

DRAWING NO. 1

ENGINEERING
3916 VERO ROAD, SUITE K BALTIMORE, MD
21227



BORING NUMBER RW-1 PAGE 1 OF 2

CLIEN	IT No	orth Point	Builders	PROJEC	T NAME	BCC	C Loop Imp	oroven	nent A	dditonal		
			G22002	-			Baltimore,					
_			18/22 COMPLETED 1/18/22				353 ft		HOLE	SIZE 6"		
			CTOR Kim Engineering Inc.	-	D WATER	LEVE	LS:					
		METHOD			TIME OF	DRIL	LING					
			CHECKED BY TL				ING					
		ved @ 31			TER DRI	LLING						
					Lu		Ś	Ţ_,		A S	PT N VALU	JF 🔺
_	ဋ	NO.			F F	۸۲ %)	JENT (E)	PEN	2	PL	MC	LL
DEPTH (ft)	GRAPHIC LOG	'ATI	MATERIAL DESCRIPTION		LE 1		PES PES	(ET)	털	i i	-	<u> </u>
5	GR.	ELEVATION			SAMPLE TYPE NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	☐ FINE	S CONTEN	IT (%) [
		Ш			75	ॡ	뮵	۱ <u>۳</u>	□	20	40 60	80
-			White, light brown, dark brown, greenish brown, gray, light gray, moist, stiff to hard, sandy SILT rock fragments.	dark (ML) with						#1 #1 #1 #1 #1 #1		
-										- 1		
: 4												8
5												
												1
												4
					√ ss		4-5-8	1				
10					1 33	78	(13)			1		
												*
					SS 2	89	7-7-7	1				:
15					2	99	(14)	-		1		- :-
										1		
12												•
7												•
					\ss	89	8-8-9	1				
20					3		(17)	1		<u></u>	- -	÷
-												1
-												*
1											\	:
2F					SS 4	89	7-15-20 (35)				7	3
25					4 -		(55)					÷
1												
												:
		324.50	DISINTEGRATED ROCK classified as grayish b	rown	1 00	-	10-34-37			:		\ !
30		02 7.00	greenish brown, dark brown, light brown, light gr moist, very dense, silty SAND (SM) with decom	ay,	SS 5	100	10-34-37 (71)			i		A
			moist, very dense, silty SAND (SM) with decompose rock fragments.	oosed	-/-					•		1
												į
										:		:
	**	319.50			√ ss	400	5-10-10	1				±
35		1			SS 6	100	(20)			1	§ §	

KIM ENGINEERING, INC. Consulting Geotechinical Engineers Baltimore, Maryland BORING NUMBER RW-1 PAGE 2 OF 2

CLIENT North Point Builders PROJECT NAME BCCC Loop Improvement Additional PROJECT NUMBER G22002 PROJECT LOCATION Baltimore, MD SAMPLE TYPE NUMBER BLOW COUNTS (N VALUE) POCKET PEN.
(tsf)
DRY UNIT WT.
(pcf) ▲ SPT N VALUE ▲ RECOVERY (RQD) DEPTH (ft)
GRAPHIC
LOG ELEVATION MC LL MATERIAL DESCRIPTION ☐ FINES CONTENT (%) ☐ 40 60 Grayish brown, greenish brown, dark brown, light brown, light gray, moist, medium dense to very dense, silty SAND (SM) with decomposed rock fragments. (continued) SS 7 5-13-19 100 (32) 9-7-16 SS 78 8 (23)20-23-35 SS 9 100 (58)50 299.50 DISINTEGRATED ROCK classified as grayish brown, greenish brown, dark brown, light brown, light gray, moist, very dense, silty SAND (SM) with decomposed SS 10 100 50/5" rock fragments. >> SS 100 50/2" 11 SS 12 100 50/1" 291.40 Bottom of hole at 61.6 feet.

GEOTECH BH PLOTS BCCC LOOP ROAD IMPROVEMENT ADD GPLGPJ GINT US GDT 3/10/22

KIM ENGINEERING, INC. Consulting Geotechinical Engineers

BORING NUMBER RW-1B PAGE 1 OF 2

			Builders	PROJEC	T NAME	BCC	C Loop Imp	roven	nent A	additonal	
			G22002				Baltimore,				
			18/22 COMPLETED 1/19/22				352.66 ft		HOLE	SIZE 6"	
			TOR Kim Engineering Inc.		WATER	LEVE	LS:				
			H.S.A								
			CHECKED BY _TL								
		ved @ 48			TER DRI	LLING					
		722	· 				"		92	A CDT NA	/ALLIE: A
Ē,	SHIC G	NOIT			SAMPLE TYPE NUMBER	ERY %	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL MO	C LL
DEPTH (ft)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		AMPLE	RECOVERY 9 (RQD)	OWC (NVA	OCKE.	NY UN	☐ FINES CON	
					S	læ l	16	ь.		20 40	60 80
5			Greenish brown, dark gray, dark brown, moist, n dense to dense, silty SAND (SM) with decompo- fragments.	nedium sed rock							
					√ ss	100	5-9-9	:			
10		220.46			1		(18)				
15		339.16	Greenish brown, gray, dark brown, moist, stiff, s SILT (ML).	andy	SS 2	89	7-10-16 (26)			\	

 20		334.16	Gray, white, greenish brown, moist, very dense, SAND (SM) with highly decomposed rock fragm	silty ents.	SS 3	100	15-23-30 (53)				•
					V/ 99		13-20-40				
25					SS 4	89	(60)				1
	<i>\$777</i>	324.16	DISINTEGRATED ROCK classified as greenish	brown	V/ 88		22 22 42				
30		324.10	gray, dark brown, moist, very dense, silty SAND with highly decomposed rock fragments.	(SM)	SS 5	100	22-33-46 (79)				*
= 1/		1			1						
35	Y				SS 6	44	25-50				

BORING NUMBER RW-1B PAGE 2 OF 2

			Builders			-,	C Loop Imp		nent_/	Additonal		
PROJ	ECT	NUMBER	_G22002	PROJEC	TLOCA	ATION	Baltimore,	MD	_	·		
		7			H	8	S LS (Z	₹	▲ SP	T N VAL	UE 🔺
DEPTH (ft)	E S	E	MATERIAL DESCRIPTION		<u> </u>	E G		F &	흔	PL I	MC	LL 1
	GRAPHIC LOG	ELEVATION	WATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	□FINES	CONTE	
					\ &	뽒	BLO)	S	lg.	20	40 60	80
			DISINTEGRATED ROCK classified as greenish b gray, dark brown, moist, very dense, silty SAND (i with highly decomposed rock fragments. (continue	SM)								
40					SS 7	89	18-27-46 (73)					<u> </u>
1 10 31										0.0000000000000000000000000000000000000	/	/
- 15		309.16	Greenish brown, gray, brown, moist, dense to ven dense, silty SAND (SM) with highly decomposed in	y rock	SS 8	100	15-20-30 (50)				4	
			fragments.							0.000.000.000.000	1	
50					SS 9	100	17-22-33 (55)					
55 -		299.16	DISINTEGRATED ROCK classified as greenish b gray, brown, moist, very dense, silty SAND (SM) whighly decomposed rock fragments.	rown, with	⊠ SS 10	100	50/5"					>
-		293 96	Bottom of hole at 58.7 feet.		≃ ss	100	50/3"					^
		230.30	bottom of note at 56.7 feet.		11							

BORING NUMBER RW-2 PAGE 1 OF 1

	OT N		Builders	IIOOLO	INAME	BUU	C Loop Imp	provem	ient A	aditonai		_	
			G22002				Baltimore,						
			18/22 COMPLETED 1/18/22						HOLE	SIZE 6			
			TOR Kim Engineering Inc.										
			H.S.A CHECKED BY _TL				LING .ING						
10123	·			A	I LIX DIXI			1	·				
_ ,	၂ ၂	z			YPE R	% ⊁	E) E)	Ä.	Ϋ́			VALUE	
DEPTH	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY 9 (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	(pcf)	PL -	-	<u>С</u>	1
ן '	<u></u>	= =			SAM	REC	BLO N	P00	DRY	☐ FINE			
5		344.10	Gray, white, moist, very dense, silty SAND (SM) vock fragment. DISINTEGRATED ROCK classified as gray, white moist, very dense, silty SAND (SM) with highly decomposed rock fragments. Bottom of hole at 9.4 feet.		SS 1	78	17-27-22 (49)			20	40	60	80

BORING NUMBER RW-2A PAGE 1 OF 2

			∎ Baitimore, Maryland it Builders	PROJECT	Γ NAME	BCCC	C Loop Imp	roven	nent A	dditonal		
							Baltimore,		IOIIL 7	dallonal		
							352.6 ft		HOLE	SIZE 6.	5	
1			CTOR Kim Engineering Inc.									
			H.S.A									
ı			CHECKED BY _TL									
ı							_					
	_	T	T						_			
DEPTH (ft)	GRAPHIC LOG	NOI	MATERIAL DESCRIPTION		E TYPE BER	ERY % 2D)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL	MC	JE ▲
DEF	GRA LC	ELEVATION	WATERIAL DESCRIPTION		SAMPLE TYF NUMBER	RECOVERY (RQD)	SLOW C	POCKE (#	DRY U	☐ FINE	S CONTEN	
	CASA:		Gray, white, moist, silty SAND (SM) with rock fragm	onte			ш		ļ <u> </u>	20	40 60	80
			Auger probed with 6.25" to 4.0" then set mud tube a started running casing.									
		347.60	Advanced casing through Boulder,									
		342,60	Advanced casing through the soil. Medium dense silty SAND (SM) with rock fragemen	nts.	SS 1	89	5-10-13 (23)			_		
		340.60	Hard advancing casing through Boulder									
		339.30	Soft advancing casing through soil.									1
45	M	338.60	Hard advancing casing through Boulder.		4.00							
15 		338.10 337.30	DISINTEGRATED ROCK classified as light gray, m very dense, silty SAND (SM) with fully weathered rowith trace mica. Hard advancing casing through Boulder.	ooist, ock	SS 2	78	11-50/3"				/	/
		334.10	Soft advancing casing.									# #
20		333.10	Grayish green with white, moist, stiff, silty CLAY (CL-ML) with weathered rock, trace of mica and fine sand.	•	SS 3	67	7-9-11 (20)			\prec	1	
		331.60	Soft advancing casing.		•					***************************************		
25		328.90	Hard advancing casing.		SS	0 1	50/1"					>>/
		327.40	Soft advancing casing.		4							
30		3/3 7/1		- 1	V I						V. 1	1.5

GEOTECH BH PLOTS BCCC LOOP ROAD IMPROVEMENT ADD GPI GPJ GINT US GDT 3/10/22

KIM ENGINEERING, INC.

BORING NUMBER RW-2A PAGE 2 OF 2

	orth Point		PROJECT					nent_A	dditonal		
GRAPHIC LOG		MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL FINES	MC CONTEN	LL —I
	321.60	Grayish green, moist, very stiff, SILT (ML) with weathered rock and traces of mica. (continued) Soft advancing casing.	<u> </u>	SS 5	78	6-12-17 (29)			*		3
	318.60	DISINTEGRATED ROCK classified as grayish gramoist, very dense, weathered rock, trace mica and fragments.	een, d rock	SS 6	71	26-50/1"					
		Extremely hard advancing casing.									
	313.10	Gray, streaked and speckled white, fine to mediur grained, highly fractured, medium weathered, Sch	m nist.	SS 7 RC 1	68 (10)	50/1"					
	308.10	Gray, streaked and speckled white, fine to mediur grained, highly fractured, medium weathered, Sch	m nist.	RC 2	85 (52)						
SY/AS	303,10	Bottom of hole at 49.5 feet.									

BORING NUMBER RW-3 PAGE 1 OF 1

PRO.	JECT N	NUMBER	G22002	PROJEC	T LOCAT	TION _	Baltimore,	MD				
DATE	STAF	RTED _1/	19/22 COMPLETED 1/19/22	GROUNI	D ELEVA	TION	351 ft		HOLE	SIZE 6"		
DRIL	LING	CONTRAC	CTOR Kim Engineering Inc.	GROUN	D WATER	LEVE	LS:					
DRIL	LING N	IETHOD	_H.S.A	AT	TIME OF	DRIL	LING					
			CHECKED BY TL									
NOTE	:s	à la company de		AF	TER DRI	LLING						
					Ж	%	1S	ż	Ë	▲ SPT	N VALUE	A
DEPTH (ft)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL I	MC •	LL I
<u> </u>	8.	ELEV			SAMP	RECC (F	SLOW (N V	Pock	DRY (☐ FINES C		``
			Greenish brown, dark brown, gray, moist, medium dense, silty SAND (SM) with rock fragment.		SS 1	67	23-14-13 (27)			20 40	60	80
10					SS 2	89	5-7-10 (17)			•		
- 15		337.50	Greenish brown, dark brown, gray, moist, stiff, san SILT (ML) with rock fragment.	ndy	SS 3	56	16-9-13 (22)					
-		335.00	Rock fragments.									
20	×/*	333.00	Greenish brown, dark brown, gray, moist, hard, sa SILT (ML) with rock fragment.	ndy	SS 4	33	22-20-19 (39)			\ 		
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	327.20	Gray, streaked and speckled white, fine to medium	1	SS 5	100	50/1"					>>/
25			grained, moderately fractured, medium weathered Schist.	,	RC 1	68 (0)						0
30		322.20	Gray, streaked and speckled white, fine to medium grained, moderately fractured, medium to fully weathered, Schist with about 13 inches of silty SAI (SM) with highly decomposed rock fragments at the bottom of rock core.	ND	RC 3	65 (18)						0
	IIXI)	317.20	Bottom of hole at 33.8 feet.									
										40 134	40	580

KIM ENGINEERING, INC. Consulting Geotechinical Engineers

BORING NUMBER RW-3A PAGE 1 OF 2

			Builders						nent_A	Additonal		
	_		G22002	PROJECT				_				
			3/22 COMPLETED 3/3/22						HOLE	SIZE _6.5		
			TOR Kim Engineering Inc.									
			H.S.A									
			CHECKED BY TL									
NOTE	s			AF	TER DRI	LLING						
OEPIH (#)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL FINES C		LL −1 Γ (%)
5			Greenish brown, dark brown, gray, moist, medium dense, silty SAND (SM) with rock fragments. Auger probed with 6.25" to 4.0" then set mud tube started running casing at 3".							20 4	0 60	80
20		337.50	Soft advancing casing. Hard advancing casing.									
25		327.00 326.90	Very Dense Disintregrated Rock. (NO Recovery)		SS 1	0	50/1"	j				
-			Soft advancing casing.									
30		322.00 321.60	DISINTEGRATED ROCK classified as grayish gr moist, very dense, silty SAND (SM) with rock frag	een,	× ss	100	50/5"				ži.	

BORING NUMBER RW-3A PAGE 2 OF 2

CLIEN	NT N	orth Point	Builders	PROJEC	T NAI	VIE .	ВСС	C Loop Imp	oroven	nent_A	dditonal				
PROJ	ECT N	NUMBER	G22002	PROJEC	T LO	CAT	ION _	Baltimore,	MD						
ī	⊋	N			SAMPLE TYPE	<u> </u>	۲۲ % (UNTS JE)	PEN	DRY UNIT WT. (pcf)	▲ S PL		I VALU	JE ▲	
DEPTH (ft)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		MPLE .		RECOVERY 9 (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	Y UNI	FINE	_	•	_1	_
					AS.	-	RE	BLC (8	R	20	40	60	80	
			Soft advancing casing. (continued)												
- 35		317.00	DISINTEGRATED ROCK classified as grayish g moist, very dense, silty SAND (SM) with rock fra	reen, gments	X 5	SS 3	71	8-13-50/5"						-	>:
		315.60	Soft advancing casing.		Z. N								***************************************		
40		312.00	DISINTEGRATED ROCK classified as grayish g moist, very dense, silty SAND (SM) with rock fra	reen,		SS 4	75	13-50/2"				1000000		1	>:
		311.10	Very hard advancing casing.	ginents	\										
s: 83 5		308.40	Soft advancing casing.								*				
45		307.00	DISINTEGRATED ROCK classified as grayish g moist, very dense, silty SAND (SM) with rock frag	reen,	Χs	SS 5	100	16-50/5"							>>
		306.10 305.80	Soft advancing casing. Hard advancing casing. Very hard advancing casing. Extremely hard advancing casing.										***************************************		
50		302.00	Gray, streaked and speckled white, fine grained, fractured, Schist.	lightly		RC 1	100 (83)								
55		297.00	Gray, streaked and speckled white, fine grained, fractured, Schist.	lightly	F	RC 2	93 (90)								
a: 2	XXXX	292.00	Bottom of hole at 59.0 feet.												

BORING NUMBER RW-4 KIM ENGINEERING, INC. Consulting Geotechinical Engineers Baltimore, Maryland PAGE 1 OF 1 CLIENT North Point Builders PROJECT NAME BCCC Loop Improvement Additional PROJECT NUMBER G22002 PROJECT LOCATION Baltimore, MD DATE STARTED 1/21/22 COMPLETED 1/21/22 GROUND ELEVATION 350 ft HOLE SIZE 6" DRILLING CONTRACTOR Kim Engineering Inc. **GROUND WATER LEVELS:** DRILLING METHOD H.S.A AT TIME OF DRILLING _---LOGGED BY SE CHECKED BY TL AT END OF DRILLING _-_ NOTES AFTER DRILLING _-_ DRY UNIT WT. (pcf) SAMPLE TYPE NUMBER BLOW COUNTS (N VALUE) ▲ SPT N VALUE ▲ POCKET PEN. (tsf) RECOVERY 9 (RQD) GRAPHIC LOG ELEVATION DEPTH (ft) MC MATERIAL DESCRIPTION ☐ FINES CONTENT (%) ☐ 80 20 60 Gray, greenish brown, dark gray, moist, medium dense, silty SAND (SM) with rock fragments. 10-10-8 SS 33 (18)SS 2 5-6-10 67 (16)GEOTECH BH PLOTS BCCC LOOP ROAD IMPROVEMENT ADD GPI.GPJ GINT US.GDT 3/10/22 331.50 DISINTEGRATED ROCK classified as silty SAND (SM) ≥ ss 80 50/5" 3 with rock fragments. 20 >> SS 100 / 50/1" 329.40 Bottom of hole at 20.6 feet. 4

KIM ENGINEERING, INC. Consulting Geotechinical Engineers Baltimore, Maryland BORING NUMBER RW-5 PAGE 1 OF 1

		•										
CLIENT N						C Loop Im		nent A	dditonal			
PROJECT		21/22 COMPLETED 1/21/22			_	Baltimore, 348 ft		HOLE	SIZE 6			
		CTOR Kim Engineering Inc.						HOLL	SIZE O			
		H.S.A				LING						
		CHECKED BY _TL				ING						
1												
	T	-		1			1	_				- 4
_ ⊵ୁ	Z			YPE R	۶۲ % د	JNTS E)	PEN.	UNIT WT.	PL	PT N'		LL
DEPTH (ft) GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		MBE	Ser	CO	E (E	Per L	ĽĖ.			Ť.
_ R	ELE			SAMPLE TYPE NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY	□FINE	s cor	NTEN	Г (%) 🗆
		Greenish brown white brown maint eiff goods	CILT	0,	_	<u> </u>	-		20	40	60	80
		Greenish brown, white, brown, moist, stiff, sandy (ML).	SILI						1	:	ŧ	
											1	
s -											1	
_5											+	+
											į	
_]												55000
				√ ss	100	3-4-9					1	
10				/ 1	100	(13)					<u> </u>	-
											į	
= 4												
	334.50	Cray atracked and analysis fine to madi										
15	334.30	Gray, streaked and speckled white, fine to mediu grained, slightly fractured, medium weathered, Se	chist.	Ш						i	į	
💥				RC	100						į	
					(73)						į	
💥											į	
	329.50	DISINTEGRATED ROCK classified as greenish streaked and speckled white, silty SAND (SM) wi	gray, th	11								
20		highly decomposed rock throughout the whole ro	ck core	RC	20							
				2	(0)							
				Ш								
77877	324.50	Bottom of hole at 23.5 feet.		Ц.							1	
											ŝ	
									1	1	į	
										•	÷	ŧ
										•	į	
										•		1
									1			
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GEOTECH BH PLOTS BCCC LOOP ROAD IMPROVEMENT ADD, GPJ, GPJ, GINT US, GDT, 3/10/22

BORING NUMBER RW-5A PAGE 1 OF 2

			Builders				C Loop Im	or Inchesion and	nent_A	dditonal			
			G22002				Baltimore,						
			28/22 COMPLETED 2/28/22			-	348 ft		HOLE	SIZE 6	.5		
RILL	ING C	ONTRAC	TOR Kim Engineering Inc.	GROUNI	WATER	LEVE	LS:						
RILI	ING N	METHOD	H.S.A	AT	TIME OF	DRIL	LING						
.OGC	ED B	Y_W.S_	CHECKED BY _TL	AT	END OF	DRILL	ING						
NOTE	s			AF	TER DRI	LLING							
					ш	%	ပ	T_;	3	▲ 5	SPT N	VALU	A
I	ဋ _	N N			SAMPLE TYPE NUMBER	RECOVERY 9 (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	UNIT WT.	PL	V	IC	LL
# E	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION		<u>.</u> ⊒ <u>B</u>		8 <u>8</u>	[F]	Z g				-1
5	8,				₹3		ŠŚ	ĺŠ	DRY (☐ FINE	s co	NTEN	Γ (%)
		Ш			8	 	핌	lg.		20	40	60	80
	Ш		Greenish brown, white, brown, moist, stiff, sandy	SILT						1	1	1	
3			(ML).								:		
8											-		
										\$5 \$5	1		
,,										1	1	1	
9	1111												
5											-		÷
										1	1		
													- 8
2.5										1			
3.4			Auger probed with 6.25" to 4.0" then set mud tube	e and						8	3		
25			started running casing at 8'.								3		
10													- 1
										- 1	1		•
-											į		- 1
											3	0.00	•
Ç.		225.00									1		
		335.00	Hard advancing casing.										
											1		
15											÷		÷
85		332.40	Soft advancing casing.										÷
											3		:
													:
- 2											4		•
-													•
20		328.50	Grayish green, moist, stiff, silty CLAY (CL- ML), to	ace	√ ss	67	4-7-13			<u> </u>			
			mica and weathered rock and rock fragments.		/\ 1	07	(20)			📬	\		:
		327.00	Soft advancing casing.								/		
		326.00	Hard advancing casing.									/	:
92			<u>-</u>								3		\
		324.50	Soft advancing casing.		1					1	:	10	•
25		323.50	DISINTEGRATED ROCK classified as grayish gr	en	1 00		10.00			*	÷	i	•
		525.00	moist, hard, silty CLAY (CL- ML), trace mica and	JOI 1 ₁	SS 2	88	19-23- 50/4"						:
-	KKKKK	322.20	weathered rock.					1					:
		321,70	Soft advancing casing. Hard advancing casing.							1	:	:	:
			Fig. 5 advanting casing.							:	1		1
		320.00	Soft advancing casing.					ľ					1
15										1			/
30	COSSESSION	318.50			X				1	F 8			60 B

KIM ENGINEERING, INC.

BORING NUMBER RW-5A PAGE 2 OF 2

GRAPHIC	317.00 316.50	MATERIAL DESCRIPTION DISINTEGRATED ROCK classified as grayish green moist, hard, silty CLAY (CL- ML), with trace of mica a weathered rock fragments. (continued) Soft advancing casing. Very hard advancing casing.	nd	SAMPLE TYPE	© RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	A S	V		LL T
an Gr	317,00 316,50	moist, hard, silty CLAY (CL- ML), with trace of mica a weathered rock fragments. (continued) Soft advancing casing.	nd	V SS			Poc	RY I	☐ FINE	s co	NTENT	(%)[
	316.50	moist, hard, silty CLAY (CL- ML), with trace of mica a weathered rock fragments. (continued) Soft advancing casing.	nd	$\begin{cases} SS \\ 3 \end{cases}$	89				20	40	60	80
%	313.50					19-23-41 (64)					1	\
		Gray, streaked and speckled white, fine grained, light fractured, slightly weathered, Schist.	ly	RC 1	60 (38)	50/1"						
	308.50	Gray, streaked and speckled white, fine grained, light fractured, Schist.	ly	RC 2	98 (80)							
	303,30	Bottom of note at 44.5 leet.										
		308.50	fractured, Schist.	fractured, Schist.	308.50 Gray, streaked and speckled white, fine grained, lightly fractured, Schist.	308.50 Gray, streaked and speckled white, fine grained, lightly fractured, Schist. RC 98 (80)	308.50 Gray, streaked and speckled white, fine grained, lightly fractured, Schist. RC 98 2 (80)	308.50 Gray, streaked and speckled white, fine grained, lightly fractured, Schist. RC 98 2 (80)	308.50 Gray, streaked and speckled white, fine grained, lightly fractured, Schist. RC 98 2 (80)	308.50 Gray, streaked and speckled white, fine grained, lightly fractured, Schist. RC 98 2 (80)	308.50 Gray, streaked and speckled white, fine grained, lightly fractured, Schist. RC 98 2 (80)	308.50 Gray, streaked and speckled white, fine grained, lightly fractured, Schist. RC 98 2 (80)

BORING NUMBER RW-6 PAGE 1 OF 1

CLIEN	IT No	orth Point	Builders	PROJECT NAME BCCC Loop Improvement Additional												
PROJ	ECT N	UMBER	G22002	PROJECT LOCATION Baltimore, MD												
DATE STARTED 1/24/22 COMPLETED 1/24/22 DRILLING CONTRACTOR Kim Engineering Inc. DRILLING METHOD H.S.A																
																AT TIME OF DRILLING
								CHECKED BY _TL	AT	END OF	DRILL	.ING				
NOTES					TER DRII	LLING		_		,						
	7		7		F 4	%	STA (i	PEN.	5	▲S	PT N	VALUI	E▲			
DEPTH (ft)	GRAPHIC LOG ELEVATION	VATIO	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY 9 (RQD)	BLOW COUNTS (N VALUE)	POCKET PE (tsf)	UNIT WT.	PL 						
1				SAM	REC	B S S	8	DRY	☐ FINES CONTENT (%)							
5			Dark gray, white, brown, moist, stiff, sandy SILT	(ML).	SS 1	100	6-8-10 (18)			20	40	60	80			
 15 		333.50	Greenish brown, dark brown, gray, moist, dense, SAND (SM) with rock fragments.	silty	SS 2	44	12-19-15 (34))					
 20 		328.50	Dark gray, white, moist, stiff, sandy SILT (ML).		SS 3	100	8-10-14 (24)									
- 25		323.50	DISINTEGRATED ROCK classified as gray, brown moist, very dense, silty SAND (SM) with rock frag		SS 4	100	50/3"	1					>>			
20		321.90	Bottom of hole at 25.1 feet.	***	SS 5	(100)	50/1"						***************************************			

BORING NUMBER RW-7 PAGE 1 OF 2

CLIE	NT _N	orth Poin	t Builders	PROJECT NAME BCCC Loop Improvement Additional										
PROJ	IECT N	NUMBER		PROJECT LOCATION Baltimore, MD										
DATE	STAF	RTED 1/	24/22 COMPLETED 1/24/22	GROUND ELEVATION 350 ft HOLE SIZE 6"										
DRILI	LING	CONTRAC	CTOR Kim Engineering	GROUND WATER LEVELS:										
DRILL	LING N	METHOD	H.S.A	AT TIME OF DRILLING										
LOGO	SED B	Y SE	CHECKED BY _TL											
NOTE	s			AF	TER DRI	LLING								
					ш	%	တ	- 6		≜ S	PT N VAL	UF A		
I	ౖ	8			<u>F</u> H	%	N (i	NH		PL.	MC	LL		
E €	DEPTH (ft) GRAPHIC LOG	₹	MATERIAL DESCRIPTION		MBE I	RECOVERY (RQD)	PE PE	E (st)	틸	1	•			
2		ELEVATION			SAMPLE TYPE NUMBER	ပ္ကြမ	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	☐ FINE	S CONTE	VT (%) □		
		ш			8	≅	뮵	<u>~</u>		20	40 60	80		
			Brown, gray, dark brown, black, moist, silty SAND ((SM).						į				
										:		:		
-														
5												:		
		345.00	DISINTEGRATED ROCK classified as brown, gray brown, black, moist, dense to very dense, silty SAN	, dark	√ ss	100	18-20-41	ĺ						
			(SM).	ID.	1		(61)				<i> </i>			
										1	/	:		
	Y//	341.50	Brown, gray, dark brown, moist, dense, silty SAND		1 00		25-25-21				1/1			
10			(SM).		SS 2	89	(46)				<i>f</i>			
					1						7/ 1	:		
Ī											/	i		
											/			
	adada	336.50	White, gray, dark brown, moist, stiff, clayey SILT		1.00		5.0.04				/			
15		000.00	(CL-ML) with decomposed rock fragments.		SS 3	100	5-6-24 (30)			4	\	:		
								1			/ :			
										1	1			
											\	•		
	anna i	331.50	Light brown, gray, dark brown, white, moist, dense t	to	1 00		10 DE 25				\	į		
20			very dense, silty SAND (SM) with weathered rock		SS 4	100	18-25-35 (60)				1			
			fragments.								1 /	1		
											1 / 1	•		
			1								1/1	į		
					1 00		17-22-22				1/ 1	:		
25					SS 5	44	(44)				*			
												1		
											1	i		
1												:		
1					1 00		10-10-23				/	•		
30					SS 6	100	(33)					į		
]												\		
]														
ķ		316.50			× ss	100	50/4"					>>/		
25	WK !				× SS 7					8	1 1			

GEOTECH BH PLOTS BCCC LOOP ROAD IMPROVEMENT ADD GPI GPJ GINT US GDT 3/10/22

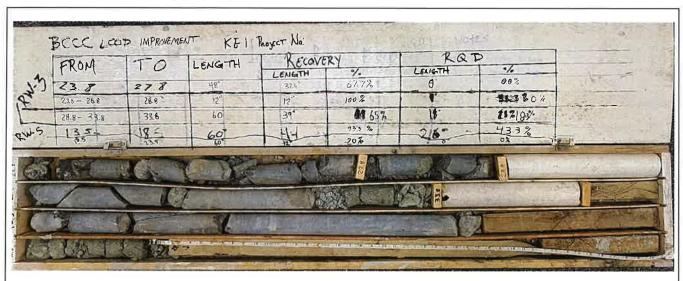
KIM ENGINEERING, INC. Consulting Geotechinical Engineers

BORING NUMBER RW-7 PAGE 2 OF 2

ROJ	ECT N	IUMBER _	G22002	PROJECT LOCATION Baltimore, MD									
		_		Ä	a % E			z	5	▲ S	PT N	VALU	E▲
(ft) GRAPHIC LOG	NOT!	MATERIAL DESCRIPTION	SAMPLE TYPE NIMBER		RECOVERY 9 (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	PL I	V	C	LL	
_	GRAPHIC LOG ELEVATION	W/W 2 W 12 J 23 J W 10 V	AMPL		S S S	N N N N		γ U G	□FINE	s co	NTEN	T (%)	
	V///		DISINTEGRATED ROCK classified as light brown,		- 1	~	<u>B</u>	<u> </u>		20	40	60	80
-			dark brown, white, moist, dense to very dense, silty SAND (SM) with weathered rock fragments. (contin	ued)									
-	XXX	312.90	Bottom of hole at 37.1 feet.	S	S	100	50/1"	1					
										1		•	
					1								
												:	
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										W. San			
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> Photo of Core Box



RW-3	Top Row	1 st Run (23.8'-27.8') and 2 nd Run (27.8'-28.8')
KW-3	Second Row	3 rd Run (28.8'-33.8')
RW-5	Third Row	1 st Run (13.5'-18.5')
LVV-2	Fourth Row	2 nd Run (18.5'-23.5')



RW-2A	Top Row	1 st Run (39.5'-44.5')
NVV-ZA	Second Row	2 nd Run (44.5'-49.5')
RW-3A	Third Row	1 st Run (49.0'-54.0')
NVV-3A	Fourth Row	2 nd Run (54.0′-59.0′)



